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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/602,366	06/23/2003	Leslie J. Record	NWISP047	1132
22434	7590	04/28/2005	EXAMINER	
BEYER WEAVER & THOMAS LLP			SEMENENKO, YURIY	
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OAKLAND, CA 94612-0250			PAPER NUMBER	
			2841	

DATE MAILED: 04/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H/A

Office Action Summary

Application No.

10/602,366

Applicant(s)

RECORD ET AL.

Examiner

Yuriy Semenenko

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-37 and 39-41 is/are rejected.
- 7) ☒ Claim(s) 38 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 June 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1 page.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a) because they fail to show: memory controller, recited in claim 3 and, as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Claim 38 is missing. Therefore, the claims have been renumbered as follows:

old claim #39 is now claim # 38;
old claim #40 is now claim # 39.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3.1. Claims 1,5-15,17-37, 39-41 are rejected under 35U.S.C. 103(a) as being obvious over L. Agatstein et al., (Patent # 6594556) hereafter Agatstein in view of R.Wachel (Patent # 6608761) hereafter Wachel.

3.1.1. Regarding claim 1: Agatstein discloses in Fig. 3 an electronic assembly, comprising: a printed circuit board 340; a processor 350 mounted on the printed circuit board; a memory 130 (Fig. 1) mounted on the printed circuit board; a routing channel 110 (Fig.1) in the printed circuit board comprising a plurality of conductors interconnecting the processor and the memory (column 3, lines 47-57); and a regulator assembly 200 (Fig. 3) comprising a regulator for providing power to the processor. A connector 335 (Fig. 3) mounted on the printed circuit board

is connected to traces in the motherboard which connect to system power supply adjacent the routing channel 110 (Fig. 1).

However, Agatstein doesn't teach a first connector mounted on the printed circuit board adjacent a first edge of the routing channel, and a second connector mounted on the printed circuit board adjacent a second edge of the routing channel opposite the first edge, the first and second connectors being coupled to the regulator and facilitating distribution of the power to the processor, the regulator and the first and second connectors forming a bridge across the routing channel.

Wachel teaches first connector mounted on the printed circuit board 32a (Fig. 2), and a second connector 32b mounted on the printed circuit board adjacent the routing channel, the regulator and the first and second connectors forming a bridge 26 across the routing channel. Wachel also discloses in the "Background of the invention" section, at the time the invention was made, it was well known to use bridges on buses of personal computers mounted on a motherboard of computer system.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Agatstein to include in his invention the first connector mounted on the printed circuit board adjacent a first edge of the routing channel, and a second connector mounted on the printed circuit board adjacent a second edge of the routing channel opposite the first edge, the first and second connectors being coupled to the regulator and facilitating distribution of the power to the processor, the regulator and the first and second connectors forming a bridge across the routing channel, as taught by Wachel.

Benefit of doing so to eliminate undesirable transmission line effects and signal degradation.

3.1.2. Regarding claim 18 and 30: Agatstein as modified discloses in Fig. 3 the electronic assembly, comprising: a printed circuit board 340 having a plurality of circuits mounted thereon (Fig. 1); a routing channel 110 (Fig. 1) in the printed circuit board comprising a plurality of conductors for interconnecting the plurality of circuits; and a regulator assembly 200 (Fig. 3) comprising a regulator for providing power to at least one of the circuits, a first connector mounted on the printed circuit board adjacent a first edge of the routing channel, and a second connector mounted on the printed circuit board adjacent a second edge of the routing channel

opposite the first edge, the first and second connectors being coupled to the regulator and facilitating distribution of the power to the at least one of the circuits, the regulator and the first and second connectors forming a bridge across the routing channel.

3.1.3. Regarding claims 5, 6, 19, 20, 31, 32: Agatstein as modified discloses the electronic assembly of claims 1, 18 and 30 (Fig.3) comprising a regulator assembly 200 (Fig. 3) comprising a regulator for providing power to the processor and first and second connectors.

However, Agatstein doesn't teach the first and second connectors are respectively configured to distribute substantially equal or unequal portions of the power to the processor.

Wachel teaches the first 32a (Fig. 2) and second 32b connectors forming a bridge 26 across the routing channel. Wachel also discloses bridge processor 30 is configured with female connectors 32a and 32b. At the time the invention was made, it was well known to use the processor to distribute substantially equal or unequal portions of the power to the processor.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Agatstein to include in his invention the first and second connectors are respectively configured to distribute substantially equal or unequal portions of the power to the processor to provide power according to the requirements of the circuitry to which power is being provided, as taught by Wachel.

3.1.4. Regarding claims 7, 8, 21, 22, 33, 34 : Agatstein discloses the electronic assembly of claim 1, 18, 30 wherein the regulator 200 is separated from a surface of the printed circuit board 340.

However, Agatstein doesn't teach the regulator in contact with a surface of the printed circuit board 340.

Applicant discloses in the "Background of the invention" section, at the time the invention was made, it was well known to employ point-of-use regulators in contact with a surface of the printed circuit board in close proximity to the components to which they provide power.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Agatstein to include in his invention the regulator is in contact with a surface of the printed circuit board for the purpose of reducing noise and power losses.

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3.1.5. Regarding claims 9, 11, 23, 24, 35: And further, Agatstein as modified, discloses the regulator 200 (Fig. 3) comprises: edge connectors 325 and a second printed circuit board 210 having regulator circuit components mounted thereon.

3.1.6. Regarding claim 10 : And furthermore, the regulator circuit components, Fig. 2, form a switching regulator circuit (column 4, lines 10-26).

3.1.7. Regarding claims 12, 25, 36 : And further, Agatstein as modified discloses the electronic assembly of claims 1, 18 and 30 (Fig.3) wherein the processor 350 is mounted in a first air flow region of the printed circuit board 340 and the memory (Fig. 1) is mounted in a second air flow region of the printed circuit board, and wherein the regulator assembly 200 is configured to inhibit air flow between the first and second air flow regions.

3.1.8. Regarding claims 13, 26, 37: Agatstein as modified discloses the electronic assembly of claims 1, 18 and 30 (Fig.3) wherein a longitudinal axis of the regulator assembly (Fig. 2) is aligned with an air flow vector corresponding to a cooling system associated with the electronic assembly.

3.1.9. Regarding claims 14, 27, 39: Agatstein as modified discloses the electronic assembly of claims 1, 18 and 30 (Fig.3) comprising connectors for facilitating distribution of the power mounted on the printed circuit board.

However, Agatstein doesn't teach the electronic assembly further comprising at least one additional connector.

Wachel teaches the first 32a (Fig. 2) and second 32b connectors forming a bridge 26 across the routing channel and further comprising at least one additional connector 32c and 32d. At the time the invention was made, it was well know to use at least one additional connector in the bridge card.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Agatstein to include in his invention electronic assembly further comprising at least one additional connector for facilitating distribution of the power mounted on the printed circuit board in the routing channel between the first and second connectors to provide more options for power distribution, as taught by Wachel.

3.1.10. Regarding claims 17, 29, 41: Agatstein as modified discloses the electronic assembly of claims 1, 18 and 30, wherein the first and second connectors are mounted such that the regulator 200 is operable as a point-of-use regulator for the at least one circuit 350 (column 6, lines 14-18).

3.1.11. Regarding claims 15, 28, 40: Agatstein as modified discloses the electronic assembly of claims 1, 18 and 30, further comprising at least one support structure 250, 255 (Fig. 2) supporting the regulator in the routing channel.

3.2. Claims 2-4, 16 are rejected under 35U.S.C. 103(a) as being obvious over Agatstein, in view of Wachel and further view of J. Keller et al. (Patent #6490661) hereafter Keller.

3.2.1. Regarding claim 2: Agatstein as modified discloses the electronic assembly of claims 1, comprising: a processor 350 mounted on the printed circuit board.

However, Agatstein doesn't teach the processor comprises one of a plurality of processors mounted on the printed circuit board.

Keller teaches the processor comprises one of a plurality of processors mounted on the printed circuit board (Fig 1 and column 4, lines 33-34). At the time the invention was made, it was well known to use plurality of processors in a multiprocessing computer system.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Agatstein to include in his invention the processor comprises one of a plurality of processors mounted on the printed circuit board to provide data transfers in a multiprocessing computing environment, as taught by Keller.

3.2.2. Regarding claim 3: Agatstein as modified discloses the electronic assembly of claims 1, comprising: a printed circuit board 340; a processor 350 mounted on the printed circuit board.

However, Agatstein doesn't teach the processor comprises a memory controller operable to facilitate communication between the processor and the memory

Keller teaches in Fig. 1 (column 4, lines 37-38) the processor comprises a memory controller 16A-16D operable to facilitate communication between the processor and the memory. At the time the invention was made, it was well known to use the processor comprises a memory controller in a multiprocessing computer system.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Agatstein to include in his invention the processor comprises a memory controller operable to facilitate communication between the processor and the memory to provide data transfers in a multiprocessing computing environment, as taught by Keller.

3.2.3. Regarding claim 4: And further Agatstein as modified discloses the electronic assembly of claims 1, wherein the memory comprises a plurality of memory modules mounted on the printed circuit board (14A-14D Fig. 1 – Keller).

3.2.4. Regarding claim 16: And further Agatstein as modified discloses the electronic assembly of claims 1, comprising a routing channel 110 (Fig.1).

However, Agatstein doesn't teach the routing channel comprises a high-speed, high-density routing channel in which selected ones of the plurality of conductors are substantially equal in length.

Applicant discloses in the "Background of the invention" section, at the time the invention was made, it was well know that because of the extremely high operational speeds of these processor designs, the dimensions of the conductors in such high density interconnects must be carefully controlled to mitigate undesirable transmission line effects and signal skew.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Agatstein to include in his invention the routing channel comprises a high-speed, high-density routing channel in which selected ones of the plurality of conductors are substantially equal in length.

Benefit of doing so to provide high quality communication between the processors and associated memory.

Relevant Art

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

4.1 S. Chheda et al., (Patent #2005/0078463) teaches a power distribution system comprises a flexible power connector, a printed circuit board, a power supply, and a processor mounted on the printed circuit board.

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4.2. J. McCall et al., (Patent #6771515) teaches a system having first and second modules and a circuit board including first and second module connectors to receive the first and second modules, respectively. Controller is in bridge.

4.3 R. Ho et al., (Patent #6677687) teaches a system for distributing power in a compact peripheral component interconnect (CPCI) computer architecture. A CPCI computer architecture comprises a plurality of CPCI systems each having respective backplanes. The backplanes further having respective local power rails providing power for a corresponding one of the plurality of CPCI systems. The power distribution system provides power to the backplanes, and comprises a common power rail connected to each one of the local power rails of the backplanes.

4.4. N.Chang et al., (Patent #6384346) teaches a trace layout of a printed circuit board (PCB) is provided with a north bridge, at least a peripheral component interconnect (PCI) slot, and an accelerate graphics port (AGP) slot. The AGP slot is mounted between the north bridge and the PCI slot.

4.5. R. Gallick et al., (Patent #6282599) teaches a backplane slot configuration and a bridge card for expanding the expansion slots of one system to include the expansion slots of an adjacent electrically separate system within the same cabinet, and bridging the expansion buses with minimal change of electrical characteristics, particularly impedance, across the bridge.

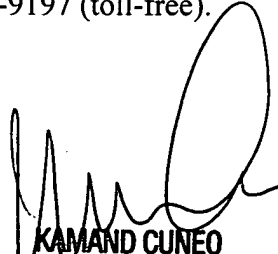
5.1. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yuriy Semenenko whose telephone number is (571) 272-6106. The examiner can normally be reached on 8:30am - 5:00pm.

5.2. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on (571)- 272-1957. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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5.3. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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